REMARKS

This responds to the Office Action mailed on October 5, 2004.

Claims 1 – 3, 5, 7 - 8, 11 - 15, 17 – 18 and 21 - 29 are amended, and claims 4 and 6 are canceled; as a result, claims 1 – 3, 5 and 7 - 30 are now pending in this application.

§102 Rejection of the Claims

Claims 1-4, 6-9, 11-14, 17 and 21 were rejected under 35 USC § 102(e) as being anticipated by Korta et al. (U.S. 6,356,663). As recited in some of the amended claims, some embodiments of Applicant's invention are directed to a two-pass video capture method in which first compressed pixel information is sent for a complete sequence of frames, and then second compressed pixel information is sent for the complete sequence of frames. The reception device synchronizes the information from both passes using a reference frame so that it can be properly combined.

Applicant's claim 1, as amended, recites that coefficients representing blocks of pixels are compressed and sent for a sequence of frames **in two separate passes**; once for a first portion of the coefficients and a second time for the second portion of the coefficients. This is like sending the sequence of frames twice, but represented by different coefficients. This two-pass approach to compressing and sending is not taught, suggested or motivated by the cited art. Separately compressing and separately sending different portions of coefficients for the frames of a frame sequence in the two-pass approach may allow the transmission of high-quality video over lower data rate interfaces, such as a USB interface, for example.

Korta et al. on the other hand is directed to real-time video displaying. Korta sends image data on ***an image-by-image basis*** for displaying the image in real time (See Korta column 8, lines 50 – 63). In particular, Korta displays a course image using decoded DC components, and then updates the course image by decoding macroblocks (see Korta FIG. 6, steps 606 through 612, and column 8, line 64 through column 9, line 14). A person viewing an image would see a course image, and then may see the image improved, before a next image is seen. This is unlike

Applicant's amended claim 1 which sends first compressed coefficients for the frames of a sequence of frames before sending the second compressed coefficients for the frames of the sequence. If one were able to view Applicant's data in real time, one may see the sequence of frames played twice.

Applicant's claim 1, as amended, further distinguishes over Korta by compressing separate portions of each block of coefficients that represents a block of pixels. Each block of coefficients can be divided into two separate portions and each portion can be compressed and sent separately. This allows the data to be transmitted over lower data rate interfaces because the compressed coefficients are sent in two passes. Accordingly, a high-quality video can be transmitted over a low data rate interface.

The Examiner states that Korta's compressed DC encoded data and compressed AC encoded data correspond to Applicant's first and second portions of compressed coefficients. Korta however divides an image into macroblocks which are 16 of the 8x8 blocks of pixels (See Korta column 6, lines 54 - 67). The AC coefficients of the macroblocks are encoded at different levels and the encoded macroblocks are packetized and sent to a decoding system (See Korta column 8, lines 9 – 33). Each macroblock represents all AC components of the image.

Applicant's compressed coefficients of the second set, for example, represent the portion of coefficients that were not in the first set. For example, in the case of a block of 64 pixels that was transformed into a block of 64 coefficients, the first set may include a compressed version of 32 of the coefficients and the second set may include a compressed version of the other 32 coefficients. In another example, in the case of a block of 64 pixels that was transformed into a block of 64 coefficients, the first set may include a compressed version of 30 of the coefficients and the second set may include a compressed version of the other 34 coefficients. This is emphasized in Applicant's amended claim 3 which recites that the first and second portions are mutually exclusive. These groups of coefficients can all have frequency components because the result of a transformation of pixels (e.g., using a DCT) generates coefficients associated with certain frequencies. Applicant's claim 7, as amended, recites that both the first and second portions of coefficients of the matrices include frequency components (i.e., include non-DC components) of corresponding blocks of pixels.

Applicant's claim 2, as amended, recites that a reception device receives the compressed first portions for the frames of the sequence prior to receiving the compressed second portions for the frames of the sequence. Applicant's amended claim 2 also recites that the reception device decompresses the first and second portions of coefficients, synchronizes with a reference frame of the sequence of frames, and combines the decompressed first portion of coefficients with the decompressed second portion of coefficients of corresponding frames based on synchronization with the reference frame to generate a combined coefficient matrix corresponding with the blocks of pixels for each frame in the sequence.

Applicants find no teaching, suggestion or motivation in Korta of synchronizing with a reference frame to combine decompressed coefficients as recited in Applicant's amended claim 2. In Korta, a single image is sent and then that same image is updated. Korta therefore, would have no reason to synchronize because only one image is generated at a time. As discussed above, Applicant claims recite sending data for the frames of a frame sequence in two passes. The data from the two passes can be combined properly, for example when a reference frame is used for synchronizing.

Claim 13, as amended, recites a method of generating a high quality video bit stream from coefficients received over an interface. Each frame of a sequence of frames comprises blocks of pixels, and each block of pixels is represented by a coefficient matrix. Claim 13 recites decompressing a first portion of coefficients of the coefficient matrices for each frame of the sequence, and then decompressing a second portion of coefficients of the coefficient matrices. The second portions are received for each frame of the sequence subsequent to receipt of first portions, and the first and second portions of corresponding coefficient matrices of each frame are combined to generate combined coefficient matrices corresponding with the blocks of pixels. Claim 14 further recites that a reference frame is identified for use in combining the first and second portions. As discussed above, these recitations are not taught or disclosed by Korta.

Because Korta does not teach or disclose every element of Applicant's claimed invention as recited in claims 1 - 4, 6 - 9, 11- 14, 17 and 21, Applicants submit that claims 1 - 4, 6 - 9, 11-14, 17 and 21 can not be anticipated by Korta and that the rejection of these claims under 35 U.S.C. §102 has been overcome.

§103 Rejection of the Claims

Claims 10, 22 and 24-30 were rejected under 35 USC § 103(a) as being unpatentable over Korta et al.

Claim 22, as amended, is directed to a system for generating a bit stream representing a high quality video. The system includes a serial interface to receive first portions of coefficients of a plurality of coefficient matrices for frames of a sequence of frames. Each frame comprises a plurality of blocks of pixels and each block of pixels is represented by one of the coefficient matrices. The serial interface is to further receive second portions of coefficients of the coefficient matrices for the frames after receipt of the first portions. The system also includes a decompressing element to decompress the first portion of coefficients and to decompress the second portion of coefficients. The system also includes a combining element to combine the first and second portions of coefficients for corresponding frames based on a reference frame to generate combined coefficient matrices corresponding with the blocks of pixels. Claim 24 further recites that the system includes a processing element to generate the bit stream from the combined coefficient matrices representing the frames of the sequence, and a storage element for storing the bit stream.

Claim 25, as amended, recites a video capture device that includes a compressing element to transform blocks of the pixels to corresponding matrices of coefficients and to compress first portions of the coefficients for frames of a sequence of frames. The video capture device includes a serial interface to send the compressed first portions of coefficients over a serial link for each frame in the sequence, and a controller to instruct the compressing element to compress second portions of the coefficients and cause the compressed second portions of coefficients to be sent to the serial interface for each frame in the sequence after the compressed first portions are sent.

As discussed above, Korta does not teach or disclose a two-pass video-capture system as recited in claims 10, 22 or 25 in which first portions of compressed coefficients are sent to a reception device for frames of a sequence of frames, and then second portions of the compressed

coefficients are sent to the reception device for the frames of the sequence. Furthermore, Applicant finds not teaching, suggestion or motivation of a controller to compress second portions of the coefficients and cause the compressed second portions of coefficients to be sent to the serial interface for each frame in the sequence after the compressed first portions are sent, as recited in claim 25. In view of this, Applicant's submit that claims 10, 22, 24 and 25 are allowable over Korta.

In addition to claim 25, claim 26 further recites that a controller instructs the compressing element to compress the second portions of the coefficients in response to a switch mode signal from a reception device coupled with the serial interface. The switch mode signal is received after the reception device receives the coefficients from the sequence of frames during the first pass and instructs the video capture device to compress and send the second coefficients for the second pass. Applicant's find no teaching suggestion or motivation in Korta to provide a switch mode signal for use in this context.

Claims 18-20 were also rejected under 35 USC § 103(a) as being unpatentable over Korta et al. and further in view of Ohkuma et al. (U.S. 5,845,041). Claim 18, as amended, recites that the first portions of coefficients are re-sent for the initial frames of the sequence. These initial frames are used to identify a reference frame (in the initial frames) so that when the second portions of coefficients are sent, the compressed coefficients from corresponding frames of the first and second portions may be properly combined.

Ohkuma, et al. discloses high-speed replay for image decoding. Applicant finds no teaching, suggestion or motivation to identify a reference frame of resent initial frames, as recited amended claim 18. In Ohkuma, there would be no reason to identify a reference frame because there is no combining sets of coefficients from a two-pass transmission process as recited in Applicant's claim 18, as dependent on claim 13. In view of the above, Applicant submits that claims 18 – 20 are allowable over the cited art.

Allowable Subject Matter

Claims 5, 15, 16 and 23 were objected to as being dependent upon a rejected base claim, but were indicated to be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 5 has been amended to include the limitations of base claim 1 and intervening claim 4. Claim 15 has been amended to include the limitations of base claim 13, and claim 23 has been amended to include the limitations of base claim 22. In view of this, Applicant submits that claims 5, 15 and 23 are in condition for allowance. Claim 16 is believed to be allowable at least because of its dependence on claim 15.

Conclusion

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney, Greg Gorrie at (480) 659-3314, or Applicant's below-named representative at (612) 349-9592 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: MS Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 22 day of November 2004.

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